

Amendments to the Claims

Please amend the claims to read as follows.

1. (Currently amended): A method for manufacturing an optical device comprising:
moving a mask situated between a layer of optical waveguide material to be shaped and a source of etchant ions, wherein ~~the motion of the mask exposes~~ at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions, thereby causing vertical thickness variations between the at least two areas.
2. (Original): The method of claim 1, wherein the mask has a comb shape comprising teeth.
3. (Original): The method of claim 1, wherein the mask has a comb shape and wherein the mask comprises tapered teeth.
4. (Original): The method of claim 1, wherein the mask comprises at least one slit.
5. (Original): The method of claim 1, further comprising a stationary mask.
6. (Original): A vertically tapered waveguide produced by the method of claim 1.
7. (Original): A diffraction grating produced by the method of claim 1.
8. (Original): The method of claim 1, wherein the mask moves in a linear direction with respect to the plane of the optical waveguide direction.
9. (Original): The method of claim 1, wherein the mask moves with a reciprocating motion with respect to the plane of the optical waveguide direction.
10. (Original): A method of micromachining comprising:

etching through a moving mask so that a desired sidewall shape is produced in an optical material, wherein the moving mask is a comb mask comprising teeth and the motion is a reciprocating motion.

11. (Currently amended): An optical device comprising:

a waveguide comprising a vertically tapered portion and a non-vertically tapered portion; and

a diffraction grating disposed at the non-vertically tapered portion, wherein the waveguide and the diffraction ~~filter~~ grating are made from a monolithic optical material, and wherein the monolithic optical material is over a substrate common to both the waveguide and the diffraction grating.

12. (Canceled).

13. (Canceled).

14. (Currently amended): A method for forming a waveguide with a vertical taper, comprising the steps of:

- a) forming a waveguide;
- b) disposing a movable mask above the waveguide;
- c) moving the mask along the waveguide while exposing the waveguide to an ~~directional ion~~ etching process, so that a vertical taper is formed in the waveguide.

15. (Original): The method of claim 14 wherein the waveguide comprises silicon.

16. (Currently amended): The method of claim 14 wherein the ~~directional~~ etching process is selected from the group consisting of deep reactive ion etching, plasma etching, ion beam milling, and laser-chemical etching.

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17. (Original): The method of claim 14 wherein the mask is in contact with the waveguide.

18. (Original): The method of claim 14 wherein the mask is up to 250 microns above the waveguide.

19. (Original): The method of claim 14 wherein the mask is moved a distance of 50-1000 microns.

20. (Original): The method of claim 14 wherein the depth of the taper is in the range of 0-5 microns.

21. (Original): A vertically tapered waveguide made according to the method of claim 14.

22. (New): An optical device comprising:

a waveguide comprising a taper surface that provides a vertical taper to the waveguide; and

a diffraction grating disposed on the taper surface, wherein the waveguide and the diffraction filter are made from a monolithic optical material, and wherein the monolithic optical material is over a substrate common to both the waveguide and the diffraction grating.